

REMARKS/ARGUMENTS

Further consideration of this application is respectfully requested.

In response to the Examiner's rejections of independent claims 1 and 12 under 35 U.S.C. §112, second paragraph, each of these claims has been amended so as to avoid use of the term "capable". However, the amendments are intended to still reflect a meaning which indicates that the node has the capacity to maintain its type of connection even if no such connections exist at the time the node is seeking to join the network.

Claims 1 and 12 have also been further amended to clearly indicate that the network has a topology type in which the constraints are the same for each node joining the network. That is, the network has a topology type in which each node joining the network is constrained by the same connection rules -- which connection rules comprise features specifically identified in the claims.

A new independent claim 31 is also presented. Claim 31 and the above noted amendments to claims 1 and 12 are believed to be supported by the description found at page 8, lines 19-30 of the specification and elsewhere.

The rejection of claims 1, 3-6, 8-12, 14-17, 19, 27 and 29-30 under 35 U.S.C. §103 as allegedly being made "obvious" based on newly cited Tachibana '351 in view of earlier cited Gregerson '358 (erroneously identified at line 3, on page 3 of the Office Action with the newly cited Tachibana patent 5,699,351).

New Claim 31 and the above amendments are supported by the description on page 8, lines 19 to 30 of the specification.

The claims have been clarified to indicate that the network topology is constrained by the application of connection rules which are the same for each node joining the network and to iterate the connection rules which are applied to each node.

Tachibana relates to "Icon Display and Method to Reflect the intuitive perspective of correlation between icons which have hierarchical relationships". Figure 4 is a map prepared by arranging icons indicating nodes belonging to respective hierarchical levels on concentric circles with the icon indicating the root positioned in the center. Tachibana does not teach application of a constraint comprising applying the same connection rules to each node joining the network when a new node is to join the existing network. Tachibana merely teaches separating out nodes so they can be displayed conveniently.

The applicant's invention addresses the technical problem of how to improve network performance by reducing congestion experienced at certain bottlenecks in the network connection topology. The invention constrains the number of connections between nodes which in fact results in longer paths as less connections are made available between nodes. However, the manner of the connections formed enables traffic performance to be improved.

Starting from Tachibana, the person of ordinary skill in the art who sought to improve the performance of the network being mapped would need to consult a technical work which indicated how network performance can be improved. That is, in the first

instance, Tachibana is not close prior art given the technical problem addressed by applicant's invention. Nothing in Tachibana indicates that the network topology should be constrained by applying connection rules to improve network performance.

However, even if a person of ordinary skill in the art were to read Tachibana, and then to consult Gregerson '351 which relates to "Node Management in a Scalable Distributed Computing Environment", the applicant's invention as set out in independent claims 1 and 12 would still remain non-obvious. For example, nothing in Gregerson teaches constraining the network topology in the manner of claims 1 and 12.

In fact, Gregerson teaches away from the claimed invention. In Gregerson a "role" is a hierarchical level that a node can assume (see Col. 2, lines 19 to 20). A kernel resides at a network node that has one or more resources attached to it. The kernels dynamically locate each other in real-time to form and maintain a hierarchical structure that supports a virtually unlimited number of independently running kernels. (Col. 2 lines 52 to 56). However, it is quite clear in Gregerson, that "*The role(s) assumed by any node within the managerial hierarchy employed is arbitrary, i.e., any node can assume one or multiple roles within the hierarchy and assuming one role neither requires nor precludes the assumption of any other role*" (Col. 3, lines 12 to 17). In particular, "*The number of possible roles or levels that may be assumed by any node is not limited and may be selected based on the particular requirements of the networking environment*". (Col. 3, lines 22 to 25).

Gregerson thus does not teach a network topology to which connection rules are applied in the manner of the applicant's invention. In fact, quite the opposite is the case, as a node can assume any possible role or level without regard to its location in the networks according to Gregerson (Col. 3, lines 16 to 30). This is therefore contrary to limitations imposed by claims 1 and 12.

Moreover, according to Gregerson, Figure 4 shows a PIPES Logical Network 33 (referred to as PLN in Gregerson). The PLN namespace is divided into five different levels: normal, area, group, domain and network (Col. 6, line 67 to Col. 7, line 1), although the number of levels is not limited to five. The number of levels in the PLN is defined by MinLevel and MaxLevel. The kernels that have normal privileges are configured at minLevel (Col. 7, lines 34 to 36). The configuration parameter Max Status imposes a ceiling on the highest level of which a kernel can be a manager. A kernel at level n is termed to be a child of its parent at level n+1, provided that the two kernels have the same name space above level n. (Col. 7, lines 39 to 44).

This is completely contrary to the concept of imposing connection constraint conditions using connection rules according to the claimed invention. Gregerson simply teaches in Col. 7, lines 41 to 44, that providing two kernels have the same level in the network hierarchy (the same name) above level n, then the kernel at level n is the child of its parent at level n+1. That is, a node at level 3 of a network can be considered the child of a node at level 2, if both nodes have a level 1 connection above level 2.

In this respect, the Examiner's opinions regarding claims 11 and 22 are also traversed. These claims require that the specified number of connections $k-1$ (or k) is substantially the same for every node. This is effectively stating that a child in a level can have siblings providing all children have the same number of siblings. Gregerson at Col. 7, lines 39 to 44 does not apply any limitation - it simply defines how nodes can have a parent/child relationship in the network.

Similarly, regarding claims 3 and 14, the Examiner's opinions are respectfully further traversed. Gregerson does not teach attempting to maintain the specified number of $k-1$ further connections between nodes. The abstract of Gregerson relates to determining network resources in a context bridge which is able to route packets between nodes. The technique involves setting up a list of context bridges and listening for routing information packets which are periodically broadcast by other context bridges, and updating the database using the information contained in the received routing information packets. This does not apply a constraint to the nodes in the form of connection rules - this is simply determining how a packet should be routed and how to establish a route across the network topology - i.e., it requires awareness of available routes over established links - it does not constraint the topology of the links established between the nodes!

The applicant's invention seeks to obtain performance advantages and a decrease in traffic congestion around particular nodes by imposing the connection constraints. It is submitted that a person of ordinary skill in the art who has read Tachibana and Gregerson

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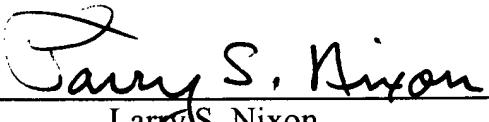
is still not led to consider the problem of improving network performance by reducing congestion around particular nodes by reducing the number of connections a node can form in the network.

In view of fundamental deficiencies of both the cited references noted above with respect to certain of applicant's claims, it is not believed necessary to discuss further deficiencies of these references with respect to other features of the rejected claims at this time.

Accordingly, this entire application is now believed to be in allowable condition and a formal Notice to that effect is respectfully solicited.

Respectfully submitted,

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